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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/819,621	03/29/2001	Kenji Todor	P 280037 T7K0-00S105-1	4396

909 7590 03/25/2003

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EXAMINER
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ANGEBRANNDT, MARTIN J

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 03/25/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

AS-5

# Office Action Summary

Application No. 09/819,621		Applicant(s) TODORI ET AL.	
Examiner Martin J Angebranndt		Art Unit 1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 29 March 2001 and 10 September 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All   b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                 | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2 &amp; 4</u> . | 6) <input type="checkbox"/> Other:  |

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1. Claims 6,15 and 25 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 6 requires that the polymer be bound to the semiconductor particles, while claim recites that an organic group is bound to the semiconductor particles. Claim 6 should recite that the organic group covalently bound to the semiconductor particles is part of the polymer.

See also claims 15 and 25, have the same problem.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iida et al. EP 0580346, in view of Murray et al., "synthesis and Characterization of nearly monodisperse CdE (E=s,se,te) semiconductor nanocrystallites", JACS, Vol. 115(19) pp. 8706-8715 (1993), Spanel et al. '910 or Liz-Marzan, et al. WO 99/291934.

Iida et al. EP 0580346 teaches a high density optical disk with a shutter layer of semiconductor particles dispersed in a glass or polymeric matrix over coated with a reflective layer as shown in figure 2. Useful semiconductor materials in amounts of 1-80 mol % and having sizes of 0.1 to 50 nm are disclosed. (3/11-33) The use of polymers as the matrix materials, including PMMA, polycarbonate, polystyrenes, polyolefins, and epoxies is disclosed as its the formation of the layer from a solvent based solution. (3/34-41 and 4/3-13). The

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reflective layer may be various metals including Ag, Au, Al and Cu. (4/44-51). The use of protective layer is also disclosed. (4/52-57). Another embodiment is shown in figure 3.

Murray et al., "synthesis and Characterization of nearly monodisperse CdE (E=s,se,te) semiconductor nanocrystallites", JACS, Vol. 115(19) pp. 8706-8715 (1993), teaches the synthesis of nanocrystalline semiconductor particles to reduce polydispersity and improve the uniformity of surface derivitization (capping). (page 8706, right column) The ease of dispersal in various solvents (alkanes, aromatics, long chain alcohols, etc) is disclosed. (page 8707, left column). The use of these in optical is disclosed. (page 8706, left column)

Liz-Marzan, et al. WO 99/291934 teaches methods for stabilizing particles to prevent agglomeration/coalescence without affecting their properties.(2/16-22). The ligands which bond to the surface of the particles may be thiols, amines, phosphines, phosphates, borates, carboxylates, silicates, siloxy, ... (3/10-28). The stabilization of CdS and other semiconductor materials, having sizes of less than 100 nm, preferably less than 40 nm is disclosed. (7/24-8/17 and examples) The use of this technique for stabilizing the particles for optical uses in a variety of matrices, including polymers, is disclosed. (13/18-23).

Spaniel et al. '910 teaches semiconductor particles in a polymeric matrix, where ligands are used to bond to the surface of the particles to stabilize the particles and then polymerized to form a matrix. useful particles are disclosed. 2/22-29). The ligands bonding to the surface of the particles and then undergoing polymerization, including silanes and the like are disclosed. (2/66-3/45).

It would have been obvious to one skilled in the art to modify the article of Iida et al. EP 0580346 by using the processes of either Murray et al., "synthesis and Characterization of

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nearly monodisperse CdE (E=s,se,te) semiconductor nanocrystallites", JACS, Vol. 115(19) pp. 8706-8715 (1993), Spanel et al. '910 or Liz-Marzan, et al. WO 99/291934 to form the particles alone or in their matrix with the benefit of increasing the stability of the dispersion and uniformity of the particles.

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

JP 03-199137 teaches the use of a silane coupling agent in a mixture which form a sol-gel polymeric glass, where the silane bonds to the particles.

Takaoka et al. '141 teaches the use of semiconductor particles dispersed in a matrix in optical recording. (5/47-60).

Morimoto et al. '345 teaches phase change inorganic optical recording media where the reflective layer is on the side of the recording layer opposite the side which the reading/writing illumination comes from. (6/42-65).

Buckingham et al. '031 teaches phase change inorganic optical recording media where the reflective layer is on the side of the recording layer opposite the side which the reading/writing illumination comes from. (8/64+).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebrannndt whose telephone number is 703-308-4397. The examiner can normally be reached on Available Mondays-Thursday and alternative Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703-308-2464. The fax phone numbers for the

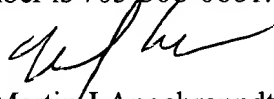
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organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Martin J Angebranndt  
Primary Examiner  
Art Unit 1756

March 19, 2003